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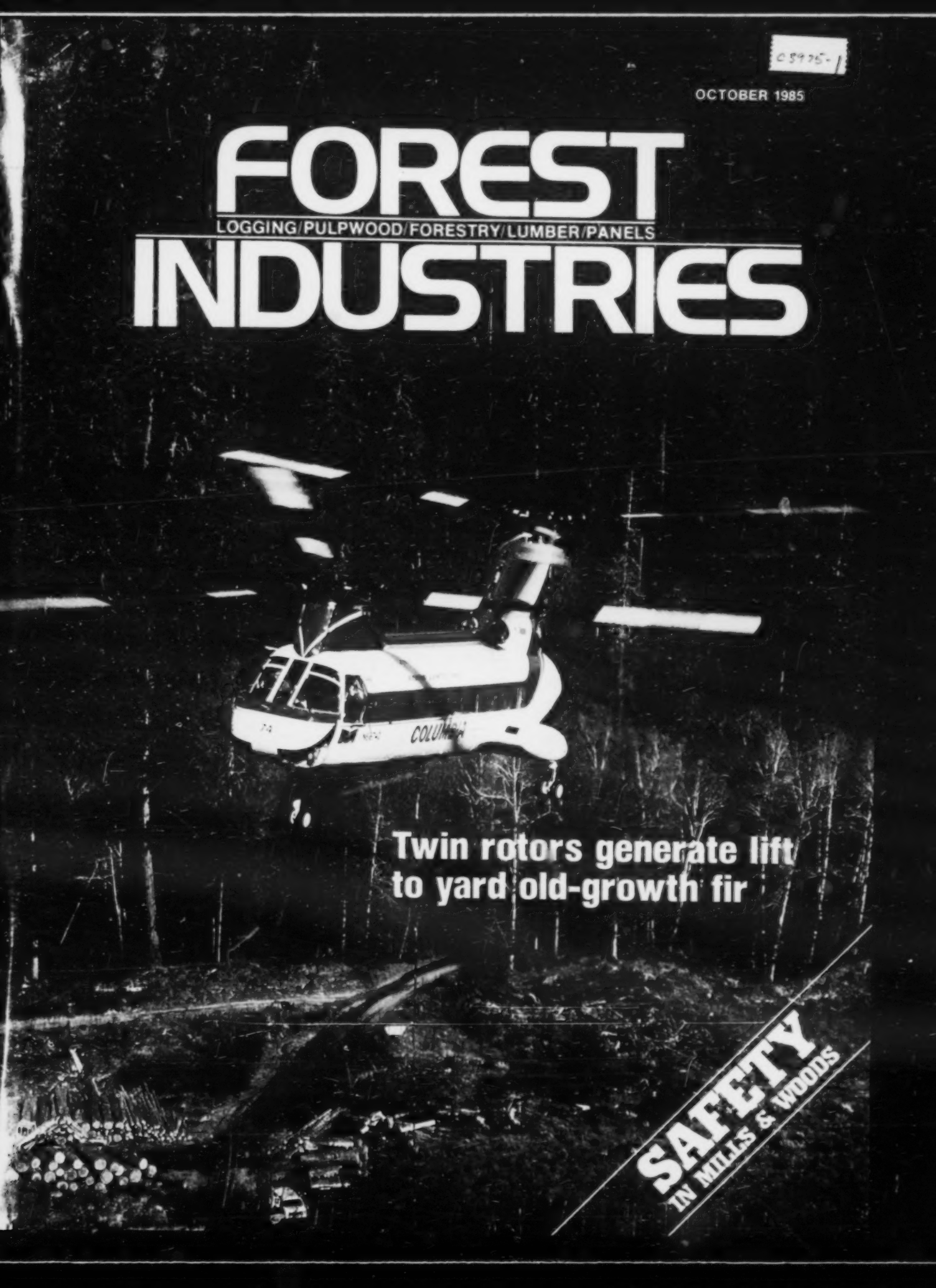
OCTOBER 1985

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS



Twin rotors generate lift to yard old-growth fir

SAFETY IN MILLS & WOODS

1985 Volume 112 Number 10

OCTOBER

Woods

20
Soaring with eagles: it could have happened
Lump-sum BLM sale in Coos Bay, Ore., was purchased and logged by Columbia Helicopters; old-growth Doug fir logs were sold to several mills

26
New Omark feller-buncher scores high during field tests in Arkansas
Boom-mounted felling head has demonstrated impressive speed and efficiency during side row thinning, says contractor Allen Bedell, Fordyce, Ark.

Mills

22
New bandmill adds quality to hardwood product line
Brothers at Begley Lumber Co., Hyden, Ky., reinvest profits and build a modern mill, the latest of their upgrading efforts

24
Mechanized thinning helps forest and also yields biomass for power plants
Highly mechanized logging remains rare in the West. But Morbark equipment demo, held in Long Barn, Calif., shows one way to produce low-cost biomass for wood-fired plants

Safety

32
Analyzing logging injuries: who gets hurt and why?
Information gathered from over 1000 injured loggers indicates that 75% of accidents result in lost time; over half the injuries occur at the cutting site

34
What an operator can do to improve chain saw safety
A range of safety features is making chain saws less dangerous than before, but additional precautions must be taken by operators to reduce risk

36
Toxic waste requirements cover wood preservatives
Companies using wood preservatives are advised to take steps to meet new federal requirements that govern the management and disposal of hazardous substances

38
First aid/CPR training is adapted to wood industry
An emergency medical training system that can be adapted to the wood products industry has been developed by Emergency Medical Planning Inc. (EMP), located in Eugene, Ore.

Departments

5 **For the Record**
17 **FI Stock Index**
41 **Equipment**
46 **Maintenance**
48 **Computing for Profit**
51 **Industry News**
52 **Making Equipment Pay**
56 **Books, Bulletins**
57 **Tips from Tommy**
60 **Newsmakers**
61 **Machinery Row**
62 **Meetings**

Exch	Company	Ticker Symbol	Closing Price 8/15/85	Closing Price 9/16/85	Net Chg in Period	% Chg in Period	P/E Ratio	Annual Div Rate	Annual Div Yield	52 Week High	52 Week Low
OTC	Bohemia Inc.	BOHM	10.88	10.88	0.00	0.00	d	.10	.92	12.50	9.00
NYS	Boise Cascade	BCC	45.38	45.25	-.13	-.29	20	1.90	4.20	51.00	36.25
NYS	Bowater Inc.	BOW	23.50	22.88	-.62	-2.64	9	.72	3.15	25.88	19.75
NYS	Champion Intl	CHA	23.25	22.13	-1.12	-4.82	d	.52	2.35	25.38	18.38
NYS	Chesapeake	CSK	36.25	36.25	0.00	0.00	10	1.24	3.42	39.50	32.00
OTC	Consbl. Paper	CPER	51.50	47.00	-4.50	-8.74	11	1.48	3.15	54.63	25.13
NYS	Crown Zellerbach	ZB	38.25	37.38	-.87	-2.27	18	1.00	2.68	44.88	27.88
NYS	Fed. Paper Board	FBO	20.00	17.75	-2.25	-11.25	8	.70	3.94	26.50	16.63
NYS	Ft. Howard Paper	FHP	77.00	76.75	-.25	-.32	17	1.84	2.40	80.75	56.50
NYS	Georgia-Pacific	GP	23.00	21.75	-1.25	-5.43	28	.80	3.68	27.38	20.00
ASE	Glatfelter (P.H.)	GLT	34.00	32.50	-1.50	-4.41	7	.88	2.71	35.75	19.38
NYS	Gr. Northern Nek.	GNN	38.00	35.00	-3.00	-7.89	11	1.52	4.34	41.75	31.63
NYS	Hammermill (H)	HML	38.63	41.00	2.37	6.14	15	1.36	3.32	42.88	26.88
NYS	Intl Paper	IP	48.63	48.13	-.50	-1.03	56	2.40	4.99	57.75	47.13
NYS	James River	JR	34.38	33.50	-.88	-2.56	11	.56	1.67	37.00	23.75
OTC	Jefferson Smurfit	JJSC	21.75	21.75	0.00	0.00	9	.40	1.84	25.25	15.00
NYS	Kimberly-Clark (H)	KMB	60.88	60.88	0.00	0.00	11	2.32	3.81	63.88	43.00
NYS	Koppers Corp.	KOP	17.63	17.13	-.50	-2.84	—	.80	4.67	22.63	17.00
OTC	Longview Fibre	LFBR	24.75	22.88	-1.87	-7.56	15	1.28	5.59	25.75	20.75
NYS	Louisiana-Pacific	LPX	19.88	18.13	-1.75	-8.80	39	.80	4.41	25.13	17.75
NYS	Mead Corp.	MEA	40.88	39.75	-1.13	-2.76	10	1.20	3.02	44.75	32.50
OTC	Mosinee Paper (H)	MOSI	14.25	15.00	.75	5.26	10	.36	2.40	16.25	11.75
NYS	Pacific Lumber	PL	28.25	28.13	-.12	-.42	18	1.20	4.27	29.25	24.13
OTC	Pentair Inc.	PNTA	28.25	27.00	-1.25	-4.42	10	.68	2.52	31.25	18.38
NYS	Pope & Talbot	POP	17.88	17.25	-.63	-3.52	d	.80	4.64	21.50	15.25
NYS	Potlatch Corp.	PCH	33.13	34.63	1.50	4.53	14	1.56	4.50	38.13	28.00
NYS	Scott Paper Co.	SPP	41.75	42.00	.25	.60	10	1.24	2.95	44.50	28.63
OTC	Sonoco Products (H)	SONO	27.00	27.00	0.00	0.00	d	0.00	0.00	29.50	18.75
NYS	Southwest Forest	SWF	12.75	12.50	-.25	-1.96	—	0.00	0.00	18.50	11.75
NYS	Stone Container	STO	29.63	27.00	-2.63	-8.88	12	.60	2.22	36.88	24.00
NYS	Temple-Inland	TIN	37.25	36.00	-1.25	-3.36	9	.64	1.78	40.38	29.63
NYS	Union Camp	UCC	38.00	37.13	-.87	-2.29	13	1.64	4.42	41.75	31.63
NYS	Westvaco Corp.	W	37.75	36.50	-1.25	-3.31	9	1.32	3.62	41.75	34.88
NYS	Weyerhaeuser Co.	WY	27.38	27.00	-.38	-1.39	22	1.30	4.81	34.00	25.88
OTC	Willamette Ind.	WMTT	43.50	43.00	-.50	-1.15	9	1.65	3.84	46.75	28.50
Canadian Forest Products Companies											
TOR	Abitibi-Price (H)	—	18.25	20.63	2.38	13.04	17	—	—	21.00	9.38
TOR	BC Forest Prod.	—	10.00	9.75	-.25	-2.50	—	.13	1.33	12.50	8.50
TOR	Canfor Ltd. (L)	—	9.00	8.13	-.87	-9.67	d	0.00	0.00	13.88	8.13
TOR	Consol.-Bathurst	—	18.63	16.75	-1.88	-10.09	14	.60	3.58	19.00	14.00
TOR	Crestbrook	—	8.38	7.50	-.88	-10.50	62	.05	.67	9.75	7.00
TOR	Crown For. Ind.	—	30.50	NA	0.00	0.00	d	0.00	0.00	31.50	30.25
TOR	Domtar Inc.	—	19.88	19.00	-.88	-4.43	8	1.40	7.37	22.38	14.50
MON	Donohue Inc.	—	18.00	17.00	-1.00	-5.56	7	.72	4.24	19.50	14.63
TOR	Great Lakes	—	22.00	19.75	-2.25	-10.23	22	.40	2.03	24.00	19.00
TOR	MacMillan Bloedel (L)	—	21.75	19.75	-2.00	-9.20	—	—	—	29.75	19.75

Market Diary

Most Active Issues

Largest dollar gainer	Abitibi-Price Inc.	+ $2.38
Largest dollar loser	Consolidated Papers	-$4.50
Largest percentage gainer	Abitibi-Price Inc.	+ 13.04%
Largest percentage loser	Federal Paper Board Co.	-11.25%

Advances, 5; Declines, 34; Unchanged, 6; New highs (H), 5; New lows (L), 2

Key

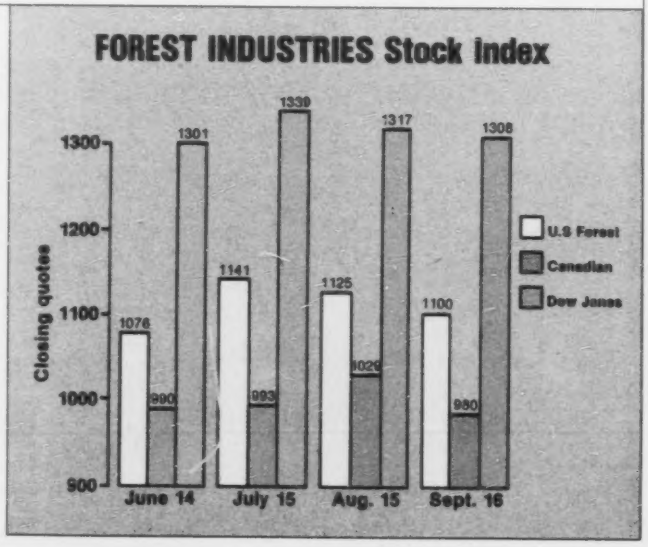
(H) = New High; (L) = New Low; (d) = Deficit.
MON = Montreal; NYS = New York; ASE = American; OTC = Over the Counter; TOR = Toronto, NA = Not Applicable.

All OTC quotes are represented as the bid price.
All Canadian quotes are in Canadian dollars.

	Close 8/15/85	Close 9/16/85	Net Chg in Pd	% Chg in Pd
Forest Industries Stock Index	1125.40	1099.51	-25.89	-2.30
Canadian Forestry Stock Index	1028.58	980.11	-48.47	-4.71
Dow Jones Industrial Avg.	1316.98	1307.68	-9.30	-.71
Standard & Poor's 500-Stock Index	187.41	182.91	-4.50	-2.40
Standard & Poor's 400 Industrials	208.29	204.05	-4.24	-2.04
NYSE Composite	108.62	105.85	-2.77	-2.55

Compiled by Nordby International Inc., Boulder, Colo. (303) 449-0326.

The information and statistics contained herein have been obtained from sources believed to be reliable, but are not guaranteed to be all-inclusive or complete. This is not to be construed as an offer or the solicitation of an offer to sell the securities herein mentioned. This information is subject to change without notice.



Information gathered from over 1000 injured loggers indicates that 75% of accidents result in lost time; over half of the injuries occur at the cutting site

Analyzing logging injuries: who gets hurt and why?

Washington, D.C.

The high risk of injury faced by loggers is reflected in the injury and illness rate for workers in that industry.

According to the U.S. Bureau of Labor Statistics, in 1982 there were 20.4 injuries and illnesses per 100 full-time loggers. That injury and illness rate is more than 2.5 times the national average. The incidence of lost-workday cases for injuries and illnesses was 12.9, more than 3.5 times greater than the national rate, and the rate of lost workdays, 303.5, was over five times greater than the national rate.

To gather information on the type and extent of injuries in the logging industry, the Bureau of Labor Statistics conducted a survey of 1086 injured loggers from April through June of 1982. A summary of the Bureau's findings follows.

Table 1—Selected jobs: Logging injuries, April-June 1982

Job	% of Injuries
Chopper, cutter, saw operator, saw hand	20
Faller, faller-bucker, bullbuck	14
Choker setter	10
Chaser	7
Logger	7
Skidder operator	5
Truckdriver, pulpwood hauler	5
Hooker, hooktender	4
Rigging slinger	4
Sawyer	3
Bucker, busheler, or woodsman	3
Knot bumper or stationary equipment operator	1

SOURCE: U.S. Department of Labor. Data based on selected states.

Occupation

Nearly half the injured workers were involved in jobs that dealt almost exclusively with cutting timber or trimming logs. As can be seen from Table 1, 16% of the workers were involved in yarding at the landing site (chaser, hooker or hooktender, rigging slinger, knot bumper, and stationary equipment operator). An equal proportion were classified either as choker setter or skidder operator—jobs involved in transporting logs away from the cutting site.

Age, experience and pay

Three-fifths of those injured were less than 35 years old and, of these, about one-third were under 25. Yet, overall, the workers were experienced, with more than four-fifths having one or more years of experience in the logging industry, and two-fifths having at least 10 years.

Nearly two-thirds of those injured were paid on an hourly or weekly basis, while one-third were paid straight piecework rates. Several workers stated they felt piecework encouraged unsafe practices since they had to work as fast as possible to make what they considered a living wage. However, hourly or weekly paid workers occasionally complained that they too were under pressure to produce as fast as possible regardless of safety. Slightly more than one-fifth of the workers indicated that working too fast was a contributing factor to their accidents.

Lost time due to injuries

Nearly three-fourths of the workers surveyed lost time because of their injuries. The average lost-time case resulted in 23 days away from work. One-fifth of those injured required hospitalization, with an average hospital stay of six nights.

The most common injuries were cuts, lacerations, or punctures, which affected one-fourth of the workers, followed by sprains and strains, suffered by slightly fewer than one-fourth of those surveyed. Fractures accounted for about one-seventh of the injuries. About one-third of the cases involved injury to the legs, ankles or feet. Of these, injury to the legs, just over one-fifth of the cases, were more frequent. Injuries to the trunk (including back injuries) occurred in almost one-fourth of the cases, and injuries to the upper extremities occurred in just under one-fourth of the cases.

Activity at time of accident

Nearly one-quarter of the injuries were accounted for by workers felling trees, while those limbing and bucking accounted for 15 and 12% of the injuries, respectively (Table 2). Workers who were choker setting or hooking up turns accounted for 14% of the injuries; workers engaged in tractor or cable skidding operations, 9% of the injuries. The proportions of injuries resulting from chasing activities and loading or unloading were 5% each. Some 4% of the injuries occurred to workers involved in rigging cable yarding systems (setting up skid cables, blocks and tackles, or guylines).

Location of accident

The logging site can be roughly divided into three major areas: the cutting site, the landing, and the skid trails in between. More than one-half of all injuries occurred at the cutting site; one-fifth at the landing; and slightly fewer than one-fifth occurred on skid trails. Most of the remaining injuries took place on roads while workers were transporting logs, equipment or other crew members.

Sloping terrain and ground cover of any type tend to hamper movement of fallers and other personnel, whether moving from one cutting site to another or running from falling trees. Nearly three-fifths of the workers reported that their accidents occurred on moderately or steeply sloped terrain, and more than three-fifths said the ground was covered with moderate to heavy brush or ground cover.

Protection equipment

Most workers were wearing some personal protective equipment; only 4% said they weren't wearing or using any. Almost nine out of 10 workers were wearing hard hats at the time of injury, and three out of four were using gloves.

Boots with caulked or corked soles were worn by three out of five workers, while nearly three out of 10 had boots with steel toes. Three out of 10 workers were equipped with either chaps or kneepads to protect their legs from injury.

A number of workers volunteered comments about personal protective equipment. Their remarks often had to do with comfort, visibility, being able to hear noise in the work area, or the practicality of wearing the equipment.

Footwear was described as a problem by several workers who noted that boots suitable for general logging work or operating equipment were not necessarily good for walking on logs (spiked boots were recommended for that purpose). On the other hand, spiked boots were not practical for most other logging activities, particularly operating equipment.

Several workers were decidedly against wearing chaps, saying that they restricted movement. One worker specifically stated he believed his injury occurred when his legs became entangled in his chaps while running from a falling tree. He tripped and was hit by the tree.

Some workers commented that, although goggles were useful in protecting the eyes from sawdust and other flying objects, they were usually hot and uncomfortable or restricted peripheral vision. Hearing protection was perceived by some to be a hazard since workers call warnings to each other. However, some workers overcame this problem by using whistles or a visual code system to indicate such things as falling trees or moving equipment in the vicinity.

Workers who were operating tractors, trucks or other mobile equipment when they were injured were asked about the safety features on the equipment. Although there were seat belts in 32 of the 51 vehicles, only six workers indicated they were using them. Almost three-fifths of the vehicles had cages or covers to protect against falling objects, while slightly more than one-half had rollover protection.

More than seven out of 10 workers injured by chain saws indicated the saws had one or more safety features. The most common, present on four of the 10 saws, was a low-kickback chain. More than three out of 10 saws were equipped with chain brakes, and two out of 10, with deadman switches.

Workers struck by wood

Nearly one-fourth of the workers were struck or crushed by limbs, trees, or logs, making this one of the most prominent causes of injury. These accidents occurred in a variety of ways. Deadwood or "widow makers" were sometimes released spontaneously or during the felling process as the tree dropped or as it struck nearby trees on the way down. Factors such as twisted or leaning trunks, rotted wood, or wind caused some trees to fall in unexpected spots. If a tree did not fall into a clean "bed," wood or ground litter catapulted into the air when the tree struck the ground.

Of the 259 workers struck or crushed by wood, about one-half were hit by falling trees, limbs, or branches, while one-quarter were struck by wood catapulted through the air by "springpoles," which occur when wood under tension suddenly is released.

Table 2—Selected activity at time of accident April-June 1982

Activity	% of Injuries
Felling	23
Limbing	15
Choker setting or hooking up a turn	14
Bucking	12
Tractor or cable skidding	9
Chasing	5
Loading/unloading	5
Rigging	4

SOURCE: U.S. Department of Labor. Data based on selected states.

Accidents involving falls

Almost one-quarter of the workers received injuries as a result of slips, trips or falls.

Of these, three-quarters either fell from elevations or fell to the same level; falls from elevations and falls to the same level occurred in equal numbers. About three-fifths of the workers who fell from elevations were walking or standing on logs. Many of these workers simply lost their balance on these uneven surfaces and fell to the ground, while other falls were attributed to slippery or loose bark or to the sudden shifting of the log.

One-fourth of the falls from elevations occurred when workers fell from mobile equipment, most frequently trucks. One-tenth of the workers were originally at ground level but fell to lower surfaces, often into ravines or stream beds.

Of those who fell to the same level, about two-fifths fell to the ground. These falls were accounted for by such things as protruding roots, deadwood, leaves, vines, and other woods litter as well as rocks and uneven ground. One-fourth of the workers who fell to the same level landed on felled trees or other wood on the ground.

Accidents involving chain saws

One-fifth of the workers were injured by chain saws. Nearly two-thirds of these workers said the accident occurred when the saw kicked back. Most of the other injuries involving chain saws occurred when workers fell on their saws. Over three-fourths of those injured by chain saws were cutting with the saw when the injury occurred.

Safety training

More than six out of 10 workers indicated they received safety training in logging.

Supervisors of employees provided safety training for four out of 10 workers, and nearly three out of 10 were trained by a coworker.

Contributing factors

Almost two-thirds of the workers cited one or more natural conditions that contributed to their accidents. Close to one-fifth said heavy brush or ground cover was responsible, while slightly more than one-tenth blamed steep terrain. About one-tenth also indicated that springpoles or wood under tension caused their accidents.

In responding to a question regarding other contributing factors, more than one-fifth of the workers blamed their accidents on working too fast. The next more frequently mentioned contributing factors were: misjudging time or distance needed to avoid injury, cited by one-seventh of the workers; and being unaware of hazards, one-tenth of the workers.

Time of accident

Workers were asked to provide information about when during the workday their accidents occurred.

Relatively few accidents, 7%, happened during the first hour of work and slightly more than double this amount occurred during the second hour. Accidents peaked during the third hour of work and dropped off during the rest of the workday.

In general, those responding to the survey took pride in the physical demands of their work and seemed resigned to the fact that they would experience accidents occasionally. Although climbing through underbrush or up and down hills or mountains while carrying a chain saw or other logging equipment places stress on the body, relatively few workers, only 64, attributed their accidents to fatigue.

However, one-third of the accidents occurred when the person injured had been working from 1 to 2 hours without a break, and a similar proportion occurred after two to four hours of unbroken work. ■

Changing requirements worldwide, plus new technology developed for domestic applications, add up to greater export opportunities for Finnish machinery suppliers

Foreign trade lifts Finland's economy

OVER TIME, machinery developed by Finnish manufacturers to suit domestic forest industry requirements has been considered too specialized for effective use—or at least customer acceptance—outside the Nordic countries. This was particularly true in shortwood logging applications.

This picture has changed dramatically in recent years. In many cases, experience gained in harvesting and processing Nordic timber has given Finnish machinery suppliers a technological edge in international markets, thus the incentive to bring their marketing guns to bear on these targets.

When the Finnish forest industry found itself facing the need for thinning systems, for example, machinery suppliers easily adapted techniques developed for shortwood logging and designed a new generation of small harvesters and forwarders which are attracting attention, and receiving a marketing push, in North America.

Meanwhile, machinery makers have been quietly marketing applicable logging products such as cranes, forest tractors and clam-bunk skidders to developing countries, building a worldwide reputation for product quality, while an efficient distributor network in the UK has proven effective in matching Finnish machines to UK requirements.

In solid-wood manufacturing, the large plants and high-volume small-log processes typical of Finland have formed the base for a sawmill and panel machinery industry that is innovative and competitive by worldwide standards in the related fields of processing machinery and electronic process control technology.

Joint-venture and reciprocal licensing connections between Finnish and North American sawmill and panel machinery companies have accelerated a technology exchange which illustrates both the greater degree of commonality among elements of the wood industry on both sides of the Atlantic Ocean and the strategy of Finnish manufacturers to expand export sales.

Distribution of Finnish forest industry exports, 1983

Destination	FIM million	%	%
Europe	20,306		80.9
EEC	13,881	55.3	
Great Britain	4,900	19.5	
W. Germany	3,390	13.6	
France	1,777	7.1	
Netherlands	1,135	4.5	
EFTA	2,006	8.0	
Sweden	802	3.2	
Comecon-Eur.	4,063	16.2	
USSR	3,686	14.7	
Asia	1,799		7.2
Africa	1,204		4.8
N. America	872		3.5
USA	824	3.3	
Latin America	409		1.6
Oceania	503		2.0
TOTAL	**25,093**		**100.0**

SOURCE: Board of Customs Statistics.
NOTE: Approx. FIM 6.0 = US$1.0

Finland's prosperity and economic development are linked to a dependence on foreign trade. Exports account for about one-third of the gross domestic product. Finnish foreign trade is preponderantly oriented to Western Europe, which in 1982 accounted for 51.4% of its imports and 54.1% of its exports. The Socialist countries were next, with 27.8% of imports and 28.8% of exports, of which the Soviet Union accounted for 26.1% and 28.1%, respectively.

On the export side, the Finnish forest industry has traditionally been the No. 1 earner of foreign currency, accounting for 38% in 1982. Combining solid-wood and pulp/paper segments, it accounts for over one-fifth of the gross value of total industrial production and employs one-fifth of the industrial labor force.

Approximately 80% of the entire Finnish forest industry's production is exported, while the input of imports in processed wood-based goods is only 15%. Despite production and capacity increases, the ratio of forest industry exports to total Finnish exports is declining as other categories grow at a faster rate. Forest products accounted for 69% of total exports in 1960 and 38% in 1982. Production of the Finnish forest industry has quadrupled between the early 1950s and 1982.

Production of sawn lumber declined somewhat after 1960 until the devaluation of the Finnmark in 1967. Output then rose to a peak of 8.1 million m^3 in 1973. In 1983, Finland's 300 major sawmills produced 8.0 million m^3, of which 62% was exported. (The Central Assn. of Finnish Forest Industries, which supplied these statistics, estimates there are another 8200 small sawmills supplying local needs.)

While forecasts that European consumption of solid-wood products would increase at a slow rate have limited growth in the sawmilling segment of the industry, sizeable investments are being made in rationalization, integration, automation and marketing coordination. Finland's biggest export market for sawn lumber is Great Britain.

Finland is the world's leading exporter of plywood. The biggest markets are West Germany, Great Britain and Sweden. In 1983, Finland's 26 plywood and veneer mills produced 580,000 m^3, of which 85% was exported. Parallel with an expansion of capacity in recent years has been an improvement in product quality and diversification into product innovations as a result of the development of new glues and gluing techniques, and development of more productive manufacturing techniques.

The particleboard industry is the youngest segment of the wood-based panel industry, having started in 1956, but grew 10-fold between 1959 and the peak year of 1975. Domestic consumption and export volumes have declined since the late 1970s. Production of 11 particleboard mills in 1983 was 605,000 m^3, of which 31% was exported.

About 55% of fiberboard production is exported, with the UK the No. 1 market. Hardboard comprises 85% of fiberboard exports, vs. insulation board and medium-density fiberboard (MDF).

—The Editors

PICTURED ON THE COVER of this special section is a new Lokomo Makeri 34T thinning harvester working on a forest site near the factory in Tampere.